QUESTIONS AND DISCUSSIONS.

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DISCUSSIONS.

In the first discussion this month Professor Moritz shows a method of deriving the area bounded by a parabola and certain straight lines by principles of elementary character such as are used in obtaining the area of a circle in plane geometry. The method applies with equal ease to the ordinary quadratic parabola and to parabolas of higher order. It is not likely that this proof will be entirely intelligible to all the students of an ordinary high-school class; but the same statement holds in connection with the area of the circle. It is worthy of note that the validity of Professor Moritz's proof depends on the possibility of saying that the quantity which he calls F^2 remains finite for all choices of r and n; this is easy to see on writing out the value of F^2.

Mr. Haldeman shows how to solve a cubic equation graphically by means of ruler, compass, and an appropriately chosen equilateral hyperbola, and applies the result to the graphical construction of the side of a regular heptagon inscriptible in a given circle. Since equilateral hyperbolas differ only by translations, rotations, and similarity transformations, it seems possible that the construction could be performed by the use of ruler, compass, and a given fixed equilateral hyperbola.

Professor Schmiedel indicates a method for obtaining the sum of a definite number of terms of certain types of series, and gives some interesting interpretations of the results. All the series considered are of frequent occurrence in connection with Fourier series and other allied developments.

The fourth discussion is a short note by Mr. M. W. Jacobs on the reason for the occasional success of a false rule for finding the hypotenuse of a right triangle in terms of the two sides. The case actually considered, even in the extended form of the corollary, is so simple as to be almost obvious. If we ask when it is possible for the hypotenuse to be represented linearly with rational coefficients (neither being required to be unity) in terms of the perpendicular sides, we have a slightly more complicated case, which leads to a familiar type of Diophantine equation. May we have the discussion of this case also?

I. ON THE QUADRATURE OF THE PARABOLA.

By R. E. MORITZ, University of Washington.

While most books on analytical geometry derive the formula for the area of an ellipse from its relation to the area of the circumscribed circle, the attempt is but seldom made to derive the formula for the area of a segment of the parabola.